



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/967,187

09/28/2001

Gregory E. Howard

TI-29894

5978

23494

7590

11/06/2003

TEXAS INSTRUMENTS INCORPORATED  
P O BOX 655474, M/S 3999  
DALLAS, TX 75265

EXAMINER

SOWARD, IDA M

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/967,187

Applicant(s)

HOWARD ET AL.

Examiner

Ida M Soward

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

This Office Action is in response to Applicants' amendment filed May 9, 2003.

### *Response to Amendment*

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 3 are rejected under 35 U.S.C. 103(e) as being unpatentable over Admitted Prior Art Figure 1 in view of Chambers et al. (6,124,180).

Admitted Prior Art Figure 1 teaches a bipolar junction transistor, comprising: a buried collector layer **20**; a collector region **30** adjacent to the buried collector layer; a base region **40** adjacent to the collector region; and an emitter region **50** adjacent to the base region. Admitted Prior Art Figure 1 further teaches the same buried collector edge to base region edge distance **70** as the distance **90** of the claimed embodiment of Figure 2. However, Admitted Prior Art Figure 1 fails to teach a counterdoped collector

region. Chambers et al. teach a counterdoped collector region 12 (Figures 10, cols. 3-4, lines 10-67 and 1-46, respectively). Since Admitted Prior Art Figure 1 and Chambers et al. are both from the same field of endeavor (bipolar junction transistors), the purpose disclosed by Chambers et al. would have been recognized in the pertinent art of Admitted Prior Art Figure 1. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the BJT structure of Admitted Prior Art Figure 1 with the BJT having a counterdoped collector region of Chambers et al. to permit the collector region to be more highly doped, hence providing a lower resistance collector (col. 4, lines 40-43).

Claims 2 and 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art Figure 1 and Chambers et al. (6,124,180) in view of Kabir et al. (US 6,346,452 B1).

Admitted Prior Art Figure 1 in view of Chambers et al. teaches all mentioned in the rejection above. However, Admitted Prior Art Figure 1 in view of Chambers et al. fails to teach at least one of the dopant species in the collector region having a dopant concentration greater than  $0.5 \times 10^{17} \text{cm}^{-3}$ , a SiGe base, and types of scattering centers. Kabir et al. teach that at least part of the collector region has a doping concentration of  $2 \times 10^{17} \text{cm}^{-3}$ , a SiGe base (col. 5, lines 7-14) and neutral phosphorus scattering centers (cols. 2-3, lines 66-67 & 1-42, respectively). Since Admitted Prior Art Figure 1, Chambers et al. and Kabir et al. are from the same field of endeavor (bipolar junction transistors), the purpose disclosed by Kabir et al. would have been recognized in the

Art Unit: 2822

pertinent art of Admitted Prior Art Figure 1 in view of Chambers et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the BJT structure of Admitted Prior Art Figure 1, the BJT having a counterdoped collector region of Chambers et al. and by incorporating the collector doping concentration, SiGe base and phosphorus scattering centers of Kabir et al. to increase the frequency performance of bipolar transistors (cols. 2-4, lines 66-67 and 1-2, respectively).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following patents are cited to further show the state of the art with respect to bipolar transistors:

Hastings et al. (5,933,034)

Sirsi (4,283,236).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M Soward whose telephone number is 703-305-

Art Unit: 2822

3308. The examiner can normally be reached on Monday - Thursday, 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9319 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ims  
October 30, 2003



AMIR ZARABIAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800